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ABSTRACT

This paper describes a program in which engineering students enrolled in a technical writing course at Newark College of Engineering wrote science textbooks that were donated to the Plainfield Public Library and were read by third and fourth graders. The course emphasized the importance of considering the intended audience in technical writing. The students were given guidelines concerning science literature books for children and were encouraged to answer the following questions as they read a series of professionally written science books for children. What is the overall content of the book? What size is this book? How many pages does it contain? What kinds of sentences are used throughout the book? How does the author use figures of speech? Does the author use parallel structure? How could this book be improved? Did the author reach the audience level for which he is writing? Some of the comments these books elicited after distribution are discussed and the titles of many of the books are listed. (TS)

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ENGINEERING STUDENTS WRITE BOOKS FOR CHILDREN

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> This book has a lot of educational thoughts, and yet it was a fun way to learn.
>
> "Did You Ever Look under Your Street?"

> It was an exciting book to read because the pictures and words were neat and understandable.
>
> "Garbage: Here Today and Gone Tomorrow."

> I like this book because it tells how gravity works, and especially I like to part where the apple fell on the boy's head.
>
> "Ouch, Gravity Hurts."

These quotations were made by fourth grade students of Plainfield (New Jersey) elementary schools after they had read those titled science books written by civil engineering students of Newark College of Engineering. About twenty science books authored by these students were donated to the Plainfield Public Library and were read by the third and fourth graders.

Why did these engineering students write science books for children? The students were enrolled in a technical writing course which concerned itself with: How does a writer adapt his writings to his audience? Civil engineers have to write for different kinds of audiences--their supervisors, other engineers, technicians, and the public. The instructor wanted to emphasize the importance of considering the intended audience - by focusing on children. The student-authors responded by using graphic aids, vivid colors, humor, figures of speech, sensory details, subject-verb-object sentences, and vocabulary adapted to the reader.

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The instructor presented the class with ten professionally written books from the series "Let's Read and Find Out," published by Thomas Crowell, New York. The following books are in this series:

Before You Were A Baby	Shrimps
High Sounds, Low Sounds	Hear Your Heart
Your Skin and Mine	How You Talk
Why Frogs Are Wet	Ladybug, Ladybug
At The Drop Of Blood	A Book Of Mars For You

Since civil engineering students have an enriched, up-to-date background of science and engineering knowledge and since, as technical writers, they must consider audience level, they were given the following guidelines concerning science literature book for children and were encouraged to answer these questions as they read these books:

a. Content - What is the overall content of the book? How would you evaluate the scientific information in the book? Is the subject matter timely, relevant, and useful to the reader? Comment on the introduction (preface) and the conclusion. Does this book reflect the needs and the experience common to all of us, and yet does it have a spontaneity and freshness?

b. Format - What size is this book? How many pages does it contain? Describe its print? Does each page have "white space," or is it full of printed matter? How is color used throughout the book? Discuss its use of illustrations, pictures, charts, and graphs. Can you recommend additional graphic aids. If so, what kinds and why would you recommend them?

c. Style - What kinds of sentences are used throughout the book? Cite some examples.

How does the author use figures of speech? Cite some examples.
Does the author use parallel structure? Cite an example.
Does the author use repetition judiciously? Cite an example.
How would you evaluate the vocabulary of the book?
Does the author explain difficult terms? How does he do so?
Does the author make the reader use his eyes and ears to understand the content of the book? How does the author do so?
Does this book have humor? Is it direct and obvious?
Children love the tastes, the smells, the colors of things. Does the author use as much sensory detail as possible? How would you use more sensory details?

d. Evaluation - If you were to write a book on this subject, what approach would you use to arouse the interest of the reader? How could this book be improved? Did you learn any

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new information from the text? Did the author reach the audience level for which he is writing?

After having reviewed the professionals' science books, students were encouraged to select a subject about which they had a thorough knowledge and which would "grab" the child's interest. For example, Mel Cebulash of Scholastic, as a guest speaker to the technical writing classes, stated that children are interested in subjects concerning ecology, astronomy, and geology. Also, they love to read books about animals--snakes, frogs, bees, and shrimps. In addition, children are interested in books about the construction trades, science mysteries and riddles, and science fiction. However, students were cautioned to select a subject in which they were especially interested.

These student - authored books were circulated in the Children's Division of these New Jersey Libraries: Newark Public Library, South Mountain Library (Millburn), Montclair Libary, Van Houten Library of Newark College of Engineering, Scotch Plains Library, Kean College Library, and Plainfield Library. The librarian at the South Mountain School Library wrote:

> The reaction of our students to the engineer's books was most favorable, and the children were particularly pleased to take them home like a regularly circulated library book.

At the Kean College Library (Union, New Jersey) these science books were read mainly by elementary school teachers who used some texts in their classroom. One teacher wrote:

> I brought a batch of these books to my third graders who made a grab for them. One student said "This is the first book I read from cover to cover." These books captured the students' interests by making a difficult scientific concept seem simple. They did so by their use of bright colors, relevant figures of speech, and a good sense of humor.

At the Plainfield Library (Plainfield, New Jersey). The children's librarian said:

> Nonfiction books are just as important as fiction in a child's world. If a child is interested in something particular, he will pursue that--no matter how many copies of "Charlotte's Web" we have

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here.

But beyond the basic interest, it is a book's presentation which attracts a child. I look for things like simplicity--a few facts on each page, authenticity, and identity for the child. Also I look for beauty in a child's book--good colors and illustrations. These science books have these qualities.

Many children have expressed enthusiasm for these books. They all like them--some so much that they want to check them out and take them home.

After having written their manuscripts and having seen them being read by third and fourth graders, some students stated:

I thoroughly enjoyed the idea of possible publication. It was probably this goal that made this assignment pleasant. The rewards from the manuscript included its completion and the thought that some little kid might learn by reading something I wrote. I like kids; so the assignment was stimulating to a large degree. I could definitely enjoy doing more of these manuscripts.

In writing a child's manuscript, I found it very difficult to adapt the works to a child's level of reading; however, I enjoyed the writing because I knew the subject well, and it was a challenge to communicate this information to a lower level of a reading audience.

I found that reviewing published books on science literature for children gave me a deep insight into seeing what was expected of a writer. In this way reader adaptation was not really difficult. After I wrote the manuscript, I had a feeling of satisfaction. One helpful hint that I can give to other writers is to let a child read your manuscript soon after you have written it.

Some engineering students felt that elementary school children had no ideas about the various branches of engineering and about the duties and responsibilities of an engineer. For this reason they wrote guidance books to inform children about the engineering profession and to arouse their interests to become an engineer. Since the Engineers

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Council for Professional Development is interested in guidance information, these books were submitted to Dr. David Reyes-Guerra, Executive Director:

"Big Bridges, Little Bridges"
"The Engineering Tree"
"Eddie Electron"
"The Surveyor"
"A Better Way for Garbage"

He agreed to print these books because they were specific, concise, attractive, and inspirational. He felt that these engineering students knew the up-to-date facts about the engineering profession and that their books were not only factual but also sincere and enthusiastic.

Another source of possible publication of these manuscripts is business and industry. Having seen an article in The Sunday Star-Ledger (Newark, New Jersey) entitled "NCE Students Writing Children's Science Books," which included a picture of a children's book on water use, the Elizabethtown Water Company (Elizabeth, New Jersey) wrote:

> The concept is unique and certainly realistic. It is entirely possible that we could use this approach to communicate with the younger children in our service area. We may also be able to assist in its publication.

Members of business and industry stated that these student-authored books may indeed prove to be of value in changing the public image of engineering and in encouraging young people to consider engineering as an exciting and worthwhile career.

Some of the titles produced by NCE's technical writing students include:

ECOLOGY SERIES:

What Is Water Pollution?
Ocean Ecology
Why You Can Build Sandcastles
Where Is Down The Drain?
Our Beautiful Dams
Traffic Jams
The Solution to Pollution
Where Are Our Beaches Going?
A Loud, Loud World: Noise Pollution
Alice in Garbageland

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SCIENCE SERIES:

Let's Learn about Electricity
Kinds of Telescopes
Highways
The Children's Book of Roads
Earth's Friendly Blanket
What Makes It Rain?
Rocks Are Everywhere
On a Journey to the Moon
Did You Ever Look Under Your Street?
Henry Meets the Rockroads

HOBBY SERIES:

The Soccer Game
On the Art of Fencing
Why You Can Build Sandcastles
How Would You Like to Travel
Skin Scuba Diving
How To Keep Tropical Fish
Johnny Learns How to Take a Picture
Charlie Goes Skiing
The Guitar: Lessons in Tuning and Playing the Basic Chords

GUIDANCE SERIES:

The Surveyor
The World of Civil Engineering
Eddie Electron
I Am an Electron
The Engineering Tree
Big Bridges, Little Bridges
Ants: The Tiniest Engineers
The Adventures of an Engineer
What Does a Civil Engineer Do.

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